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THE JOURNAL OF PHILOSOPHY

TIME WE LIVE IN

"THE human being has an intimate tendency to understand himself through that to which he is in a constant and essential relation: through the world."

When Descartes bifurcated all the world's reality into two mutually exclusive substances, extension and thought, he acted in accordance with this principle. Because he believed that he thus established two irreducible and sufficient presuppositions of all being known to man. He lost from sight that presupposition which may or may not be of the world but which certainly is indispensable to the being of man himself: time. It is true that worldly entities with all their attributes presuppose extension, yet the question can still arise whether extension as such does not presuppose time. But is not thought, founding the mental substance of the human self, in all its forms founded on time?

When Spinoza arrived at the conclusion that rational truth must be in no relation to time, he also behaved in accordance with the above principle. Because his rational truth is about the world, the one divine substance which annihilates time under its perfect aspect of eternity. Yet for man time is an inherent feature of his confused imaginative consciousness which could not be other than temporal. Where man rather than the world is in question, time resists elimination. Could it be, then, that there is not a single way to think of time, but that there must be at least two? Time of the world, which may or may not be eliminable in rational truth, and then time in which we live, perhaps confusedly and prerationally, but without which we could not be?

When Leibniz defined space as the order of coexistence and time as the order of succession, he was no less true to the above-cited principle. Because the world is, if anything, spatial. In the world, or, more precisely, among its entities, no order of coexistence is conceivable but that which makes up space. And yet our awareness can have things coexist, not at all in a spatial arrangement. They are perhaps not worldly things, they are perhaps such stuff as dreams are made on: they are the phenomena of our own experience, which can occur together and thus coexist. Is it then

possible that space with all the things extended in it can be regarded as only a special case of the wider coexistence or simultaneity? And if simultaneity, as well as its succession, are temporal, then perhaps space is related to time not as to a partner but as to an ancestor?

In this manner three interrelated problems arise: of the temporal character of conscious existence, ontologically indispensable for man's understanding of himself; of a possible duality of temporal notions, some of which concern the world and some human beings; of simultaneity not spatial but only temporal, indicating a new relationship between space and time, and thus again suggesting the deeper significance of the latter for man's ontology. On the following pages an attempt will be made to cast a little light upon these problems, probably opening long vistas of darkness beyond. The attitude in this essay is strictly in agreement with the view of the author of the opening quotation, Martin Heidegger: that while ontology is the most heavily handicapped of all human enquiries, because immersed in the mystery of being, and our own being at that, if it is to amount to more than puzzles and paradoxes, it must delve first into the discouraging darkness dominating all exploration of time.

* * *

What is actually involved in speaking of time as a dimension? Is it not an attempt, for the sake of scientific convenience, to align the treatment of time with that of three-dimensional space? Yet certain difficulties arise in the course of such an attempt. Thus the quantitative treatment in terms of extensive units and numbers does not seem to be equally proper for space and for time. That space and all things extended in it are divisible and precisely measurable does not seem to call for protest. But that this technique applies to our temporal experience, may and should be questioned. Further, we can visualize the three spatial dimensions in terms of three lines, straight and intersecting at right angles. Such an imaginative experiment, however, visualizing time as a straight line, is bound to be at best only half successful. A unidimensional line would be a stretch composed, not without paradox, of non-dimensional points contiguous to each other. Consequently, in this single dimension, no more than one point can determine precisely the location or boundary of any entity. If this spatial manner of thinking is now transferred to time, supposed to be just such a single dimension, how do we conceive two or more simultaneous entities? The points along the line become non-temporal moments, and no more than one of these can determine a temporal

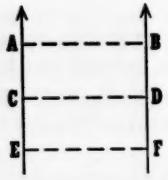
entity. In unidimensional space it would be impossible for more than one body to occupy the same position; so it must be impossible for more than one event to occupy the same position in unidimensional time. A multiplicity "across" this dimension can be admitted only in some other dimension, and so of course it is possible in space, which we think of three-dimensionally. But if time is a single dimension, events can coexist only across its stretch, in some other dimension which therefore must be spatial. Simultaneity is thus possible only for entities that are not only temporal but also spatial.

That this position is untenable becomes clear when attention is turned away from space toward that field which is preeminently temporal: the phenomenal field of consciousness. The danger of subjectivity, so often stressed within this field, must be with caution taken into the bargain.

The very first step in a phenomenological treatment of time is to restore the idea of strictly simultaneous entities, which, however, do not have to be spatial. This is indispensable for any analysis of conscious happenings. Man can live at the same time with entirely disparate, dissimilar, even conflicting entities. Either to treat them as spatial or to deny their reality is to adopt one of two equally prejudiced attitudes, motivated by man's tendency to take his ontological criteria from the world extended outside. The simple fact to be admitted here is that conscious awareness can span coexistent events, not completely reducible to each other, such as: making plans for next week-end, tiredness, recollection of a melody, longing for a loved person; other items could be added to this very example, such as watching the sky, discomfort of heat and cooking odors, but these latter could perhaps be objected to as somehow spatial. What are such coexistent entities, how separate, how interrelated? The questions rise readily to our lips, much more readily than the answers to them. They are hazardous precisely because we are so accustomed to the familiar divisions, definitions, quantifications of spatial objects. Yet while unable to determine precisely these temporal entities, can we in good faith deny their presence, their possible presence at the same time to our consciousness? Hardly. And this is all that is in question at the moment. Direct experience points to simultaneity that is in no manner spatial. If this is granted, the description of the medium in which we exist in terms of three dimensions of space and only one dimension of time can no longer satisfy. Some other sort of "dimension" is required, about which we can say that, while it is not a spatial one, it is in some way involved with the originally accepted temporal dimension of succession as applied to man's

temporal consciousness; yet it must somehow provide a "width" of time into which the span of what is consciously simultaneous can fit. The image of time as a line is inadequate. Entirely apart from space, at every successive moment we live through, there must be accommodation for a multiplicity of entities, which would be impossible as long as moments were simply points.

To visualize the situation, we can use this diagram, which of course, being a spatial presentation, should not be taken too seriously:

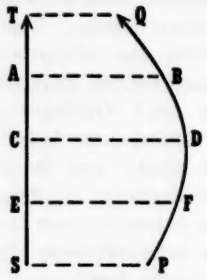


While the arrows represent temporal succession, each moment is represented not by a point but by another line, A-B, C-D, E-F. This horizontal dimension is non-spatial simultaneity in that time in which we live. Some questions immediately arise. Granted that this dimension is not spatial, can it not be assumed that it is also non-temporal, especially since the horizontal lines above refer to what is there at the "same" time? The answer must be postponed for a while; it is hoped that in the further course of the argument it will become clear that simultaneity is as inextricably involved with succession in time of which we are conscious as width and length are involved in experience of space. This also suggests how to regard the use of the term "dimension" here, because it is used not in the quantitative sense of spatial dimensions but only to provide a verbal foothold on specifically different temporal grounds. Just as it has already been suggested above that to proceed in categories of extensive quantities may be inappropriate for temporal succession in experience, so it is with regard to simultaneity. Quantification or measurement of consciousness is not to be thought of in this connection. On the other hand, what can and must be introduced now are intensive quanta of conscious simultaneity, expressible in terms of "more or less." The diagram above has improved our understanding of time of phenomena in that it showed the fault of the image of a single line or rail, substituting that of a road, wide as well as long. But the uniformity of width in lines A-B, C-D, E-F is still an oversimplification, and will have to be corrected. It can still be attempted as an explanation parallel to geometrical treatment. The width of a spatial entity such as a road is uniform if throughout its length it can

accommodate the same number of spatial entities, such as yardsticks, laid across its length; otherwise it is not uniform. The second spatial dimension in which varying widths are discovered is of course that indefinite "room to spare" across the dimension of length, where roads like rivers may become wider or narrower. To apply this: the width of a temporal entity such as a span of consciousness is not uniform if it can accommodate a variable number of temporal entities, such as witnessed phenomena, laid across its length, i.e., simultaneous. Temporal coexistence as a "second dimension" is then the indefinite room to spare in which more or fewer events may happen simultaneously.

Is this actually the case? Ordinary people speak freely of "rich experiences," of "living more fully," of "unusual demands upon one's presence of mind," and the like. Let us take some concrete phenomenal illustrations. Undergoing a crucial test, examination, or ordeal, one is torn between the contradictory observations that "time flies extraordinarily fast" and that "every moment appears much longer, much more fully packed with content." It is the latter observation that supports the argument advanced above. The consciousness of the tested person expands elastically to accommodate a much greater simultaneous presence of genuine temporal entities, in this instance ideas, recollections, fears, turns of attention, hesitations, rejections, even passing daydreams, and of course sensory perceptions. In a more average, less tense experience this crowd of conscious items would be filed one after the other, perhaps only a couple abreast; here all of them have to be, and wonderfully are, squeezed together into the same prolonged simultaneity. The difference is like that between a beginner's piano piece, one finger at a time, and a virtuoso performance where each finger is engaged simultaneously in amazing feats of its own. But what has to be noticed well is that this elastic conscious expansion hits no hard limits: the man who had the impression of a thorough work-out yesterday finds today, to his own surprise, how much more he can take care of together, under greater pressure. There is still room to spare, across the flow of time. And to make clear that this variability in the stretch of simultaneity is not a matter of merely artificial, external imposition of pressures, it may be observed that another illustration of the same possibility can be taken from an entirely different, spontaneous, and desirable phenomenon: a satisfying love experience. Again a much heightened sensitivity, again an analytic scatter of impressions drunk in avidly, in touch and smell, in shades of color and barely perceptible movements, as well as thoughts, rejoicings, pains, flutters of pride and of pity, an incredible wealth of deep and

indelible records for memory, all taken in without effort and at the same time. And the same two contradictory observations may be made about this experience. The second one, about the fullness of content of all such crowded moments, should be understandable in the light of what has been said about elastic simultaneity. What about the first one? Perhaps it will be helpful now to try a diagram of such temporal phenomena.



This sketch has to be explained carefully. The lines A-B, C-D, E-F are meant as before to represent the width of simultaneity that must not be uniform, since more coexists at the moment C-D than at E-F, and much more than at A-B. The figure is bounded on the left by the line S-T which can be straight as in the previous diagram. Let this uniform, uncurved boundary suggest that time as experienced has something in common with the conventionally uniform succession indicated by the ticking of the clock. On the right side, however, the boundary P-Q, which delimits the varying stretch of moments lived through, must be irregular, curved. Both S-T and P-Q run in the dimension of succession, of the transformation of future into past. Yet the curve of boundary P-Q, demanded by the inequality of A-B, C-D, E-F, suggests that it must be of greater length than the straight line S-T. If we were to measure these two lines by the same units which could be imagined as "minutes," P-Q would obviously "last" longer than S-T. And this feature of the diagram indicates that, although there may be a correlation between the uniform, "straight" succession of time as shown by the clock and the variable time of human experiences, we must not assume identity between them, nor an exact one-to-one similarity. This may perhaps help to elucidate the riddle of the contradictory observations about the "speed" of time. When a person living through a period of rapture or pressure observes that time flies fast, he speaks with his eye on the clock or the calendar. He expresses his surprise that the steady vehicle which in his imagination may be moving alongside S-T should already have got

so far, while the vehicle in which he travels, on the road to the same supposed future destination, must circumnavigate the mass of witnessed events, therefore takes the longer route P-Q and so remains "behind." His surprise that time flies fast is that of Achilles, who finds the plodding tortoise very far along the short track the tortoise blindly sticks to, while he, the swift-footed runner, has been leaping high and wide, as much away from the supposed goal of the race as toward it. Only Achilles has no cause for remorse: there is really no race, and never could be, between a man and the clock.

These hints may serve to fix our ideas, but in view of what has been already said about time not being unidimensional, a more exact interpretation of this sketch must be in terms not of line units but of surface units. Thus the diagram is meant to visualize an unusually rich time of our life; and this richness is represented in the whole surface difference by which the plane figure S-T-Q-P exceeds the rectangle formed if the line P-Q were drawn straight and parallel to S-T. This difference suggests two remarks. First, if S-T and P-Q were parallel, it would mean that the width of temporal consciousness is uniform, which is what has been denied in our phenomenal examples. It would mean that there are always about the same quanta of temporal entities to be taken in. But it would also mean that time we live in can be adequately measured by linear units along S-T, by the objectively invariable units such as minutes of the clock; just as we can reliably buy fabrics by the inch and yard, linear units, as long as we assume that the fabric has uniform width and so we shall get the appropriate quantity of area units. Conversely, if time we live in varies in width, it means that the measure of minutes is not sufficient for that time. The duality, mentioned at the beginning, emerges. Second, if there is in the understanding of human experience this need for sizing up time in terms of areas traversed rather than simply line distances covered, then the reason is apparent for taking simultaneity as a "dimension" not only non-spatial but specifically temporal. In terms of direct unsophisticated experience there is a great difference between distances horizontal and vertical, between stepping forward six feet and jumping six feet high; yet in geometrical terms horizontal and vertical are alike as dimensions of space. And so there is a tremendous difference between succession and simultaneity of experience; yet both are correlated in time lived in. Perhaps when man's understanding of time progresses, this correlation may be as much taken for granted as that among spatial dimensions.

* * *

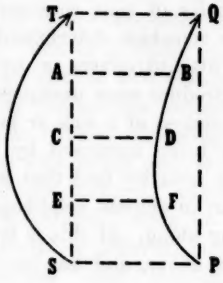
At this point an objection might be expressed about the weight of such phenomenal illustrations: all that this reference to certain subjective experiences shows is that occasionally it seems to us that time flies fast; but this is just an illusory impression, at the back of our minds we know that really times passes at an unchangeable rate and that our instruments indicate this quite reliably and in accordance with common sense. Should the point of this objection be admitted: do we really know how time passes by means of chronometrical instruments; are we sure that minutes, days, years, are always equal? If at least some wonder is awakened by this question, then it is clear that the common sense attitude must not be uncritically accepted.

If it is right to say that a man can look up at the clock and be surprised how late it is, then this indicates at the very least that he has not been aware of time passing by the clock. It does not mean that he has not been aware of time; on the contrary, in situations examined above a central feature is the unusual, added awareness of prolonged simultaneity. Thus actually the surprise element here indicates that time by the clock is compared with time we live in, and that the results do not tally. But this is a relatively simple problem.

Let us now take the opposite phenomenon. Instead of a man consuming a greater quantity of time with his hands full of simultaneity, in relation to whom the clock and the calendar move too fast, let us now consider a man in relation to whom they move too slow. Examples are easy to produce. In a period of illness there is such a characteristic narrowing of the conscious span: immobility, apathy, the shunning of decisions, inability to concentrate and to take in a great many witnessed events. Time trickles through, as opposed to its previous flood. Or, to emphasize again the fact that such experiences have nothing to do with evaluations, that they may be chosen as well as imposed, let us mention periods of mild content: where the attitude is that of doing within modest means, where the person narrows his consciousness to a modicum of comfort without ambitious reaching for more, easy in four walls and a garden, undisturbed, not searching, relaxed. In such phenomena the width of simultaneous events is lessened, and so is the whole "area" of time consumed. Accordingly, a look at the clock or the calendar will result in the observation that "time moves very slow," although it could also be observed that "each moment flashes by almost empty of content." The analysis of the previous, opposed phenomena may indicate how this conflict is to be explained. While the clock measures its minutes uniformly, or so we tend to assume, the man, within his narrowed channel of con-

sciousness, lives through less content, and thus observes how little happens to him, compared with what more ordinarily could happen within such a number of "minutes." Time by the clock makes such inconsiderable progress here, it lags behind.

If this situation should now be visualized in a diagram, some inadequacies of spatial representation will definitely show up.



In this diagram the lines A-B, C-D, E-F have been drawn as before, to represent the width of time taken in, in this instance a width not only less than in the previous sketch, but also less than normal. What is the "normal" width of time? Speaking only with reference to these diagrammatic presentations, it is the quantity contained within the rectangle S-T-Q-P, where both the lines S-T and P-Q are straight and they are parallel to each other. Since S-T is intended to refer to uniform clock time, a normal width would be one in which units of clock time adequately measured time we live in, in which the clock moved neither too fast nor too slow. But if in the present situation the moments A-B, C-D, E-F contain fewer contemporaneous events, the line P-Q, which delimits their content as before, must be irregular in a concave manner, to indicate that here the total surface S-T-Q-P is smaller than the rectangle. But now how should the line S-T be drawn? It is supposed to measure more units of length, "minutes," than P-Q, and in that case it cannot possibly be drawn straight but must be curved and curved more sharply than P-Q. What does that indicate? Simply that, when we consider time of phenomena, clock time cannot be unequivocally determined as a regular straight-line progression. Graphic presentation of variations in conscious "time areas" does not permit constancy of any boundary, although the "normal width" is determined in the rectangle S-T-Q-P, but without reference to the irregular curved line S-T which is outside of it, i.e., without reference to what the clock and the calendar may indicate. Phenomenal time is independent of

time conventionally measured; they do not seem to fit into the same diagrammatic presentation.

Of course, the fact that in such a sketch there are discrepancies just accentuates what has been said much earlier: that a spatial manner of understanding time is necessarily inadequate. Literally, there is of course no such thing as a straight line in time. Our overstrained interpretation of this diagram suggests only that variations in the quantity of time consumed consciously, greater or less or normal, are somehow determined without reference to conventional time. This introduces a new complexity, which, when elaborated, will produce some unexpected, perplexing results.

The narrow consciousness of a sick or an idling man may continue without his ever being surprised by the slow movement of his watch. Or he may actually find that his hours and days are very short; also, a man in critical conditions of tension may find his experience dragging along. If this is true, does it not contradict the analyses given above, and has anything in fact been explained there?

* * *

Why does man actually choose inanimate material objects as his instruments for the measurement of time? Is not the reason for it the conviction that such objects will note the passage of time in a faithful, uniform manner, like the stellar bodies which serve as a more constant reference? Does this in turn not mean that ordinary clocks, star clocks, or the recently introduced radiation clocks remain completely unaffected by the passage of time? Or, to put it another way, that their being is in one legitimate sense atemporal, while in the same sense our human being is temporal? But what is this sense of such expressions?

The discussion above has made use of a pair of differentiating terms, viz., time of the world and time we live in, conventional and phenomenal time; between the two a discrepancy has been noted. To avoid easy misinterpretations these terms have been used rather than the more popular pair of opposites, viz., subjective and objective time. By "phenomenal time" is meant temporality that shows itself directly and is in fact an indispensable, constituent feature of any awareness. By "conventional time" is meant the framework of indirect and avoidable observations of changes taking place in the spatial world of objects, of all objects that can be used as clocks. Such observations are not indispensable for human existence; one can not only live without chronometrical devices but even be ignorant of the most immediate worldly changes such as night and day or winter and summer.

The significance of conventional time lies in the possibility of correlation and agreement among the data of various individuals' phenomenal time.

This distinction by no means coincides with another which is more fertile in puzzles and ambiguities, and can only be sketched here. That is the possibility of a dual answer to the question: does time move? Of course, the word "move" must here have a sense different from the sense it has in descriptions of objects that move in space and time; otherwise it has no sense at all. When answering "yes" one is thinking of time as a continuous sequence, inherent in all motion and change, whether regular or not, moreover a uniquely irreversible sequence that can be neither arrested nor turned back. When answering "no" one is thinking of time as an ontological foundation with reference to which things arise, alter in internal and external relations, then perish, but which itself remains immutable. Both of these conceptions are visualized by Kant, although in different terms. Perhaps they can be referred to as "time-flow" and "time-basis." It is clear that we can speak both of phenomenal and conventional time-flow; i.e., that both the immediate data of consciousness and the external bodies are witnessed in sequence and change. When one speaks of a conventional or "objective" time-basis, there may be a division of views between the absolute conception ascribing to it an independent subsistence, not impossible even in case all entities moving in time were to be abolished, and on the other hand the relative conception which means by a time-basis only a certain order of relations among entities of the world, impossible in their absence. These two conceptions were notably represented by Newton and Leibniz. But what about the time-basis of phenomenal time?

When we speak of time in stars and clocks, we assert a certain community in their being carried together in one time-flow, or their common reference to one time-basis, even if we dispute about what the latter is. We certainly do not single out time as what could be uniquely proper to an individual object of the world. It is in this sense that spatial objects are atemporal; viz., that they do not in themselves have any singular relation to time, that time is not what makes each one what it is, but rather what makes their bond of kinship. If we rely on this bond reflected in the neutral ticking of our clocks for our common human purposes, it is because each one of us is temporal in a more intimate way, each one wears his temporality not only on his wrist but in his heart, each one has his own unique phenomenal time.

It should be noticed that the time-basis of conventional time is at least problematic: we can form theories about it and can dispute

it ontologically, although we seem to assume it as a factor in our view on the world. Therefore it is not surprising that the time-basis of phenomenal time can also be shrouded in wonder. This much, however, can be concluded thus far: in the phenomenal time-basis no communal features need to be expected. On the contrary, phenomenal time may be the trail of isolation as irreconcilable with the familiar shared stage of the world as death. And here we stand on the threshold of mystery. The question asked by men for centuries: "What are we?" does not even disclose its complexity until it is seen that no answer is possible in the communal plural or in the impersonal form. This is what the description of man as such, a unity of material and mental substance or of extension and thought, fails to show. The question can only be elucidated in the form: "What am I?", because part of the elucidation of my being has to be concerned with the precondition of my consciousness, viz., my phenomenal time, not shared with any entity of the world, perhaps altogether not of the world, insofar as I know it objectively, in space, in quantities, in essences common throughout. But how can this be elucidated?

Let us return now to the phenomenal illustrations introduced earlier. They have been used in order to point out a possible discrepancy between the flow of conventional and of phenomenal time. The latter alone is in question now. This means looking at the continuation of some consciousness that does not "check" itself by reference to clocks and calendars. Such consciousness is still temporal; otherwise it would not be conscious. It is admittedly difficult to visualize: a man on a desert island or a primitive man prior to the invention of chronometry would still speak of his time in terms of seasons or days and nights. Some of these, the crowded ones, could be long and heavy, whereas others, the idle ones, could be insubstantial and speeding on. These results, it should be remembered, are contrary to chronometrical checks; i.e., a person can say: my time flies fast, the clock's time flows slow —or vice versa. The puzzling feature is now not how phenomenal and conventional time differ, but how phenomenal time is taken in at all. Yet can we imagine that it be not taken in? Certainly not. The consciousness of a man in an isolation chamber, in a space ship, where neither night nor winter falls, is still no less in phenomenal time and can be subject to its variations of speeding up and slowing down. But if this is so, with reference to what does phenomenal time flow, or what is its basis?

The time-basis of conventional time, which adapts it so well to universal reliance, is due to the conviction about the common foundation in being of all things that are in time-flow. That con-

viction may be vaguely or explicitly put, as belief in one world, the uniformity of nature, community of all there is, essential order and regularity of the cosmos, etc. If phenomenal time, on the other hand, is due not to essential community but to existential isolation of each conscious entity, the conclusion about its time-basis is this: each conscious entity, such as a human, has its own relation to that being which is its own; that relation is its phenomenal temporality. To put it in other words: the time-basis of my own temporality, that in reference to which I move and live and consciously change, is the being which makes me what I am. Just as the common time-basis of conventional time is problematic, so the unique time-basis of each conscious existent may be unknown.

The accelerations and decelerations of phenomenal time-flow, mentioned above, are thus but sporadic glimpses into a man's own dark which he is ever trying to illumine. But the light borrowed from the world, with its public time, fails here, within. Neither the sun nor the sandglass will adequately measure the answer to the naive, ancient, ever-recurring question: how much is there of me? how much still left? And yet if we can pose this question thus, it yields a certain hint about the kind of answer which alone may be proper: it must be in finite terms. Man asking the question must be aware, however dimly, of his own finitude in existence. The glimpses he obtains of his own being in temporal flow, rapid or sluggish, would also be impossible if that flow were to be without an end. By contrast, the trust placed in the uniform flow of conventional time indicates precisely that we have no awareness of its possible termination.

How can this result be translated to interpret phenomena such as those cited already? There were four of them: pressure and rapture, where phenomenal time drags on fully loaded, while the watch seems to be racing, and illness and idleness, where phenomenal time speeds on as though *in vacuo*, while the time of the world seems to be lagging behind. The awareness of vacuous speed in me in the latter examples is then to be interpreted as my awareness of my straightforward approach to the end of my being. On the contrary, the former two illustrations where I note my slow progress onward are to be interpreted as my awareness of obstructions, reprieves, shuntings aside, which separate me now from the nonetheless sure end of my being. It may also be noted that there are basic indications of choice in these phenomena, although their sources may not be conscious at all. If I accept and choose the speedy approach of my end, the wasting of my temporal substance, that means that fundamentally I am at odds with my own being, I wish to idle trippingly through my time and may as well have it

over and done with; though enjoying its surface, I do not love my existence. Now if a rush through the wasteland of an illness worries me, is resented though so relaxing, that means I wish to fulfill myself through all my time of which I have but too little, ever. Similarly, when I embrace wholeheartedly all possible wealth of any simultaneity, dwelling on the minutiae of my cherished given, that means I protest against my future end; I wish to stay and linger in myself. While, on the contrary, when the pressure of the present is just a burden I hardly can cope with, when it is all the while nothing but an exigent bombardment of my inner resources, that means I silently prefer to surrender, the end may come and welcome, I yield myself to nothingness.

* * *

These are but feeble rays to start the elucidation of man's being. Yet, if this essay has served its purpose, they should point to an undiscovered country which we inhabit. It is the time in which we all live, though each one in his uniquely own, with its two "dimensions" of succession and simultaneity, with its independence from time of all the clocks of the world, with its intimate relation to a singular time-basis, a dark source of conscious individuality and of its choices. But what a mass of questions must now arise, not even touched upon: Is phenomenal time irreversible? Is it aimed toward the future or toward the past? What do they mean for us, these conceptions of future, present and past, apart from calendars and clocks? Is time we live in continuous? What is its negation, death, or eternity? And—what is the ontological role of time? Even to attempt to reflect on these, and a host of other questions, new steps, new phenomenal references, new thoughts are required.

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AESTHETIC KNOWLEDGE

Looking at her silently for a long time; "She is a dear dear Tess," he thought to himself, as one deciding on the true construction of a difficult passage.—*Tess of the d'Urbervilles*, Ch. 34.

IF all that he can say is that she is dear, or twice dear, it seems proper to conclude that he is not very much like one deciding on the true construction. Hardy's work may show that he himself has decided on the true construction of the lover's intense regard of Tess at that moment, and his whole story may also show, with

great force, that he has decided on the true construction of the character and fate of his heroine. If her lover does not fully satisfy the comparison in the moment of his ecstasy, it makes no critical difference, since it is not he but his author who must make satisfaction, his, the lover's, role being a construction at the hands of his author: The lover was not to our knowledge deciding on the true construction, but only enacting a part in the author's decision of it.

To decide on the true construction was perhaps Hardy's controlling concern, as it has been many an author's; a concern not restricted to construing, but including constructing also, the true construction in an artist's work being perhaps more often the constructing than the construing. In a great many instances the processes have merged, the results portraying the artist himself more probably than they do the facts he regards. To give a true construction of these results, one would have to say that they are constructions of the artist more than of the facts; that the artist has literally construed himself in them.

'Expression' is perhaps a more pleasing way of stating the case. Expression, however, is no less complex and troublesome a concept than construction. No doubt the artless and inarticulate manage something they would call expression. The fact, if it may be so presumed, that all of us are at times inarticulate, incapable of expression, despite saying out our words or grimly intimating our state, and that we are not content to remain so, is indicative of sharp distinctions in what is called expression. Striving to articulate, what is it that we have fallen short of? What hidden rule commands us? What is the difference between what we are willing and what we are not willing to call expression? What, conceivably, urged on so lucid a writer as Plato, driving him to make many revisions in the opening lines of a discourse and sometimes to abandon dialectic and resort to allegory?

A dilemma confronts anyone who would answer these questions. If he states an absolute rule or criterion, much that will still be called expression may not satisfy it, if only for the reason that artists will not all submit, some even proceeding defiantly to produce work violating the alleged requirement and presently drawing to their side other artists as well as sympathetic critics and the excited public. If on the other hand the answer rejects absolutism and upholds idiosyncrasy, it seems to follow that anything goes, in the name of expression. Rules then defeat themselves, while the lack of them defeats art.

But it does not follow that anything goes in the name of expression, if only for the reason that that would let in things unexpressive. Nor can it be said that expression has no rules, though

it may be surmised that they are sometimes of its own making, produced *ad hoc*. Expression seems to be free and, in itself, entirely original—free potentially, conceivably, at least, for there may be obstructions to it or deficiencies preventing it.

The same can be said of construction, with equal propriety, a true construction being difficult to distinguish from a true, that is, untrammeled, unwanting, expression. Suppose that in the ardent labor of performing Hamlet the actor finds it is all a task of getting him clear and that the like seems to explain the original conception of him. How to get this clear—intelligible, conclusive, uncompromised, triumphantly resolved—seems to be the question for anyone possessed of expressive capacities who is not succeeding in bringing off his undertaking. "The artist proper," says R. G. Collingwood, "is a person who, grappling with the problem of expressing a certain emotion, says, 'I want to get this clear.' "[1]

How to get it clear seems hardly distinguishable from how to find the true construction. The truth, the construction, and the expression prove to be the same thing. Apparently it is in this identification that our sense of the perfection, the authority and ultimacy, of a masterful work resides.

If the task, or the process, since art is not exactly a task (it is rather a fruition or bloom), is how to get this clear, it might be questioned whether it was not a technical problem, for how to accomplish an undertaking seems to imply an answer according to formulae and methods, making everything a matter of rule. But this would probably not describe what goes on. The 'task' is not how to get something clear; it is the getting it clear. Afterward an investigator, if possessed of the needed powers, may tell how it was done. But that is a very different thing from the original, productive performance itself—like the difference between being a poet and the giving of rules on how to be a poet, which in a sense is the difference between everything and nothing. Even if an artist were to rehearse to himself before performing, he still would have to originate something to rehearse, and in that is the whole genius of his work.

Conceivably his production may be so luminously rationalized from the first that he is never at a loss, in no need of mysterious inspiration to carry him along and nowhere left to faltering adumbration or to caprice or arbitrariness: like Stendhal traveling the high road "clear and cold" or Stravinsky discountenancing romantic, emotional display; or like the Madonna of the Rocks, before which our questions seem to be overwhelmed with immediate answers as if by a luminous, eternal form. In such a case we

[1] *Principles of Art*, p. 114.

would say he knew what he was doing, for he had it in intelligible terms; meaning that he who has found and can give the intelligible correlative of a thing has knowledge of it. Perhaps we would allow that one who, though unable to do that, yet could produce the thing, had knowledge of it too, though not in his head—in his hand rather, like a violinist, or in his discipline or temper, being eloquent without having a theory of eloquence, and giving the true construction without a theory either of truth or of construction. That would be knowledge arrested or unrationalized, matched by the case of one who begs that he knows such and such but lacks capacity to say it, a case not very different from the birds and flowers, which in that sense also 'know' how to sing and blossom—a sense so broad, however, as to take in clouds and stones, which will have to be said to 'know,' the one how to float and the other how to fall. (Such is the lack or disdain of the intelligible correlative of things in some circles nowadays that it is not uncommon to hear it called 'verbalization,' as if it were only words, or to see the term 'rationalization,' which accurately denominates it, debased to one of the dark categories of psychology, where for some time it has served to denote deceit and hypocrisy.)

'Getting this clear' may in some cases mean little more than getting it agreeable to its author, to whom its agreeableness may be an unanalyzable mystery. If 'clear' means only agreeable, according to no stable criterion or concept, it is a misleading and misused term. "Intuitively clear," one may say, "which may answer to no prior criterion or concept. There is a language of intuition, untranslatable into concepts."

This hoary libel on the power of understanding is a piece of aesthetic dogmatism. Intuition cannot argue or expound; hence it cannot presume to set limits to the powers of understanding. It does not see, but only signs, like the deaf. Nevertheless it does pretend to argue, or some do in its name. Now to say that a gesture, a pose, an inflection speaks more than words, or that lines, colors, tones, rhythms do, presumes a knowledge of what they say, since otherwise the assertion would be groundless. What they say must therefore not be ineffable. And if not ineffable, it can hardly be beyond intelligible articulation. Thus intuition in uttering its claims defeats them, and the supposition that aesthetic expression is bounded by mystery stultifies itself.

There is a formative, productive aesthetic agency, fused with intelligence, that dispels the mysteries, if that is what they are. The morning sun mysteriously transforms the mountain tops, I suppose. Not for Shakespeare. It *flatters* them, to his perceptive eyes, and that tells everything, in one word. The sun also acts

mysteriously on pale streams, though not mysteriously to him. He dispels the mystery with another word, *gilding*. Then he makes known the sun's secret power, in two words: *heavenly alchemy* (Sonnet XXXIII). I imagine that to some minds there is more aesthetic illumination in the poet's words here than in the sun's beams, and more music in his words elsewhere, about Orpheus' lute (*Henry VIII*, iii, 1), than might have been heard from the lute itself, and more poesy in those lines in which his eye ranges earth and heaven, making, ordaining, and aptly naming (*Midsummer Night's Dream*, v, 1), than in many a ponderous treatise on poesy. Another poet, Byron, finding no term to name a certain grace, turns the very lack into a name and a showing, beyond anything the eye might have seen: *nameless grace* ("She Walks in Beauty"). In Croce's *rem tene, verba sequentur* is a cold but universal light before which the mysteries of intuition vanish.

We would like to know how access to this light is attained, how to fulfill the command that we first possess the factum from which the words, the express results, are to issue, or, if not, how we ourselves might come to possess it, how a great artist did so. Is this not asking for the stars? Is there not a limit to knowing *how*, beyond which there is either no knowledge or only knowledge *post hoc*? To know how is to possess a key or cipher well suited to predetermined uses. But the determiner of every original work is the artist himself, who must therefore supply his own cipher, if that is what it is to be called. Knowing how, in his case, is a creation, for which there is *ex hypothesi* no formula.

On the other hand he is not left to spontaneity, caprice, or unintelligibility. As a chemist anticipates that a reaction of elements will give a certain result, a dramatist or novelist no doubt anticipates that a certain type of character reacting with another or with its environment will give a certain result. This, however, is science, not art; a careful reading of nature, not an investing of nature with 'heavenly alchemy.' Natural types are doubtless better defined by science than by art. They are averages—the average size, average rate, average man—found out by unmoved onlookers and census takers. Their aesthetic interest is close to zero. Unretouched by the endowed hand of an artist, they go unnoticed. Remove the exaltation given others, not the average but the extremes, by the artist, and at length they too are unnoticed. The prototype of Ajax or Andromache would perhaps not have engaged our attention very profoundly, nor that of Falstaff, perhaps not even that of Lady Castlewood, of Cyrano, the Knight of La Mancha, or Don Giovanni. The usual study of such characters or of the works embodying them is on the model of the laboratory

analyst if not that of the census taker, a plan capable of allowing the art they exemplify, which presumably is the only reason for studying them rather than history or social science, to be omitted altogether.

Aesthetic knowledge may be aesthetically analyzable, perhaps yielding aesthetic primitives, but whether it is analyzable otherwise or in any way accountable otherwise seems doubtful. To show, for example, that a poem had antecedent to it a dream or a draft of beer, or to show that vagrant musical themes happened to arise and take form as a finished work in a composer's mind, without effort on his part, while other authors were driven mad struggling to achieve—what does that prove so far as art is concerned? Probably the like could be found behind the transactions of the stock market or those of a law court. But to suppose that they constituted or determined the outcomes would be far-fetched. In aesthetics such explanations are worthy to bear the tag and odium, 'naturalistic fallacy.'

Between aesthetic and scientific knowledge the signal difference is seen in the unique, original nature of the one and the standard, methodical aim and procedure of the other. Though he requires high resources to probe the complexities of nature and to tally his results with the received system, a scientist is a soldier in the ranks most of the time, following standard procedures adapted to standardized goals and uses. Novelties, if any, will have to be interpreted, to bring them into the conventions of science, conventions which according to some (Bergson, Wittgenstein) are themselves a kind of stamp, imposing on the world perhaps as much of a picture as they draw from it. The interpretations, or theories in which the mind has a degree of freedom, correspond closest to an artist's achievements. They make by themselves no addition to the world's goods. Their value is utilitarian, simplifying and economizing our terms for comprehending the world and securing ourselves in it.

An artist's picture adds to the world even if it only pictures some object out in the world. After suitable technological advances it can be approximately duplicated mechanically, without leave of art or artist. Now science is to nature as technology here is to the picture. It produces a stereotype; art produces a prototype. For this the artist requires a unique, inner science. He must know his material more intimately than science does; in particular he must know it like knowing his hands, his voice, or his eyesight, and must be possessed of imaginative or at any rate formative powers for modeling it. Literally, virtue is knowledge here, a determinative power in the artist much like the power of

nature that molds dunes, crystals, blossoms, and life. Such knowledge is also a kind of tact, or assured feel, in which seeing and sensing are naturally joined.

Where these are finely developed or purified it seems probable that there is in them a necessity and sufficiency controlling the artist's decisions (except in exercises or divertissements, where he warms his hands, so to speak, like a composer in a cold organ loft). So there must be many a work to which the author could fittingly attach a Q.E.D. Given, as he is indeed uniquely given, certain motifs and materials, and given the wherewithal to foresee or to control their development, he may be supposed to come to results with almost the decisiveness of a logician demonstrating a conclusion entailed by given premises. At each stage in the progression there probably occurs a decision which, if accurately ascertained, would be seen to be analytic—that is, such and such antecedents unfolded into such and such consequents. The clearer and more positive the work, the more evident is this character of it. Obliquely, the more clouded or ambiguous, the less of this character in the work.

Nothing unconditionally lays down the premises, that is, the motifs, from which the Q.E.D. would derive. Perhaps they arise from long meditation, perhaps from caprice, perhaps from pure aesthetic agency. If they vary sharply in the same artist, the works he produces may seem to be antithetical, such as the raptured avowal of his beloved's beauty in one instance and his disavowal and dejection in another. If he is held at fault on the score of inconsistency or inconstancy, then evidently it is presumed that consistency and constancy rule over the arts, but whether anything so rules, unless it might be artistry itself, and whether the rule of anything else would not be a violation of the artist's ultimate autonomy are, to say the least, pressing questions. In this autonomy there is a catholicity, or light, which like that of the physical world shines in all directions, unaffected by perturbations of the source. Given high virtuosity, the opposite of any theme probably admits of equal artistic results.

Not only may analyticity be traced in at least the more powerful works and in those of superfine delicacy and lucidity; a high degree of what may be called 'confirmability,' on analogy with natural science, also may be shown. Something presented as an abstract or stereotype of physical objects, a scientific picture or true construction of them, invites examination and reexamination, which lead to its confirmation or 'disconfirmation.' If it is a skillfully derived picture, it survives these tests, thanks to the constancy of nature—to nature, not science (which only takes the

picture), belongs the rigor we customarily attribute to science. Excluding strict representation or copying, art differs from this entirely, through being originative, and still it has confirmability. Not through devices to reinstate the conditions of its productions and see whether these come out the same (though the like is sometimes taken to prove aesthetic truth!), but through submitting its productions to the perpetual judgment of the world. The verdict in very many instances from antiquity downward testifies to one effect: that the authors saw with decisiveness and ultimacy (clearness, distinctness, and order) so that their attainment shines through the ages, Phidias, Leonardo, Ghiberti, Shakespeare, Mozart, for example, being as great artists today as in their day, or greater. This might be taken as conclusive confirmation that, so to speak, under the circumstances of the production of those works, where every part is purified initially, as in a refined laboratory experiment, and the hand of the master plays over them with its peculiar tact, the result is rigorously determined, just as the laboratory result is, and that, although in such cases the variables are much more numerous and more complex, they still are cognizable. Every case is different, to be sure, but that is no discredit to it—every man is different also. Uniqueness is not unreal, and stereotypes are no more demonstrative than prototypes. An eclipse might be unique in a century, but that would not belittle the results of a scientific observation made while it lasted. Because of their comparative simplicity and stereotypic character, familiar scientific examples may mislead us into thinking they give knowledge more certainly than the arts. But consider very complex examples, such as atomic structure, muscular dystrophy, or the cause of the first World War; they make a fairer comparison with, for instance, *Guernica, Tannhaüser,* or *Tristram Shandy.*

If there is this special demonstrative virtue in the arts, how can it be said that the contrary of a given theme might yield as great a work, given high virtuosity in the artist, as that theme itself has yielded? This is like asking how the same land and sea are fair one day and foul another, a question which is adequately answered, I believe, by reference to solar and atmospheric agency. The formative agency in a piece of art, varying with the artist, corresponds. (It is finely discerned and categorized in Kant's *pulchritudo vaga.*) So the answer is in the artist himself, with his power to give even the most heinous character, like Richard III, a certain sublimity, or the power, in the case of that doomed sport of the gods, Tess Durbeyfield, to attain a serenity beyond the reach of laws and fate, matching that of the stones of Stonehenge.

A confusion between art and ontology or between aesthetic

knowledge and metaphysics pervades a great deal of writing on the arts, especially on poetry. One of the worst offenders was Wordsworth, who probably owes his reputation to this as much as anything. The very tag 'metaphysical poet' is a scandalous mark of it, a 'metaphysical poet' being no more a metaphysician that he is a scientist, though he may be artfully or sentimentally mystical, something which, however, suffices an unsophisticated scholarship to call him metaphysical, after the example of Samuel Johnson (who, had he been a Frenchman, would probably have applied the tag *'vers de société'* or the like and so prevented the rise of many a 'cloud of unknowing' over the horizon of poetic criticism later on). A recent book by the Englishman Robert Skelton, *The Poetic Pattern,* a work of discernment in spite of the author's thralldom to psychoanalysis, illustrates this confusion. He thinks that a poem "can reveal the unity of all experiences, idea, and order."[2] How would one know this? An undergraduate in the study of philosophy would take exception to the presumptuous use of 'unity,' of 'all' in lumping experience, idea, and order, and to the proposition that such things are 'revealed.' Does poetry concern unity any more than diversity? Is that not for the genius of each poet to decide? And is a poet any better qualified to speak on metaphysical matters than a coloratura or a toe dancer? The suave and knowing poet Edmund Waller owned that poets "succeed better in fiction than in truth."[3] "Lying," remarks Santayana, "is a privilege of poets because they have not yet reached the level on which truth and error are discernible. . . . Poetic apprehension is a makeshift, in so far as its cognitive worth is concerned; it is exactly, in this respect, what myth is to science."[4]

Aesthetic knowledge, being *aesthetic,* is wholly internal. If it happens to tally with something found out by natural science or with moral disposition or common sense, that is adventitious, or else we must presume that some confusion between aesthetic and non-aesthetic has occurred. A vision, trance, intimation, or state of perplexity, melancholy, or revery has in itself no probative force beyond the mind experiencing it. Those who, like Sidney or Wordsworth, suppose that an aesthetic state imports knowledge of the world, even transcending in some unnamed way all other knowledge, may be presumed to rely on a kind of ontological argument, unarticulated. That is, they take for granted that their state or idea entails the existence of objects correlative to it. Imagine then that you are king, give yourself up to the idea, paying

[2] Page 77.

[3] Taine, *History of English Literature,* Vol. II, p. 389.

[4] *Reason in Art,* pp. 100, 105.

no attention to evidence. Thus you should be entitled to royal estate, above the entitlement of hereditary claimants. When at length it is demonstrated that existence is no predicate, that having an idea of a thing is very different from having the thing, your disillusion is assured. One can, however, shun such demonstration or be so deprived as not to have heard of it, and so qualify to carry on the tradition that poetic madness is the ultimatum of sanity.

Aesthetically, a visionary state is not superior to a sensory one. Probably it is far below unmaddened vision of familiar objects in respect of purity, or clearness. Aesthetic perception is probably of particulars only, of course including moods and humors; in which case the idea that a poet, a composer, or other artist cons 'the universal,' truth, reality, everything, is categorically mistaken. He may compose very moving works on his visions and sentiments concerning such subjects, but that is quite different from cognizing the subjects.

His world is his experience. His distinctive knowledge is a true construction of his experience, a construction which he, far above other men, is gifted to produce, one radiant with the light of his genius and the purity of his motives. The construction is worthy to be called true from being express, univocal, and uncompromised by extrinsicalities, such as pretensions to non-aesthetic knowledge. Knowing himself is hardly distinguishable from fulfilling and expressing himself. It is unlike knowing others or other things; it is a poetic exhibit and differs from the self-knowledge of others by the fact that it is poetic, or, so to speak, radiantly expressive.

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BOOK REVIEWS

Philosophy of Science. Readings Selected, Edited, and Introduced by Arthur Danto and Sidney Morgenbesser. [Preface by Ernest Nagel.] New York: Meridian Books, Inc. [1960]. 477 p. (Meridian Books M 90.) $1.65.

The Structure of Scientific Thought: An Introduction to Philosophy of Science. Edward H. Madden, editor. Boston: Houghton Mifflin Company [1960]. ix, 381 p. (Under the Editorship of Lucius Garvin.) $5.00.

In his preface to *Philosophy of Science,* Ernest Nagel comments on the motley variety of problems frequently subsumed under

this title. This circumstance can become an anthologist's nightmare unless he can formulate some controlling conception of the philosophy of science in terms of which his selection of readings can be organized into a coherent and intelligible survey of problems pertaining to this discipline. Arthur Danto and Sidney Morgenbesser have succeeded admirably in devising such an approach and in seeing to its execution. As a result, their anthology is of genuine value to anyone who has an intelligent interest in the philosophy of science.

The editors of *Philosophy of Science* have construed their discipline to be concerned with rendering intelligible the kind of knowledge provided by scientific activity insofar as such knowledge is embodied in the corpus of sentences that formulate the results of scientific inquiry. Such an approach removes from the domain of the philosophy of science questions concerning the significance of science for ethics as well as psychological, sociological, and historical discussions of the process of scientific discovery. It restricts the subject matter of the philosophy of science to a systematic consideration of the kinds of sentences that are eligible for admission into the body of scientific knowledge (concept construction and explanation) and of the criteria for election of these candidates into this corpus (confirmation).

Professors Danto and Morgenbesser have wisely refrained from including within the confines of their small anthology extensive readings on both topics. Instead they have restricted themselves to articles concerned primarily with concept construction (part one) and explanation (part two). In lieu of a treatment of confirmation, part three contains articles concerned with space, time, and causality as these concepts occur in mechanics. The editors' explicitly avowed purpose is to provide an illustration of the manner in which the problems raised in parts one and two concerning science in general are related to an understanding of the conceptual apparatus developed in a specific science. Because of the same restrictions of space that preclude extensive treatment of confirmation, no selections treating problems in the biological and social sciences are included.

By refraining from complete coverage of the problems treated by the philosophy of science, the editors have found it possible to represent those topics which are discussed in a manner that larger anthologies might envy. The articles chosen are marked by almost universally high quality and by the fact that few of them are to be found reprinted in other anthologies. Professors Danto and Morgenbesser have succeeded remarkably well in arranging their selec-

tions in each of the parts so as to achieve a coherent discussion of the problems treated. Their introductions to each part provide useful orientations to the topics discussed without preempting the function of the readings.

In this reviewer's opinion, the chief exception to the editors' high level of performance is to be found in their selection of articles on quantum mechanics. Neither Professor Margenau ("Meaning and Scientific Status of Causality") nor Professor Hanson ("The Copenhagen Interpretation of Quantum Theory") nor the editors provide the kind of information concerning the philosophical problems that have been raised by quantum theory concerning causality and measurement which would provide the reader who wishes to inquire further with an orientation to these problems. To find a small number of readings that would even begin to meet this demand is admittedly a difficult task. However, the treatment of quantum mechanics might have been improved had the editors found space for an article along the lines of J. L. McKnight's "The Quantum Theoretical Concept of Measurement" (*Measurement, Definition and Theories,* edited by C. W. Churchman and P. Ratoosh), which in addition to grinding some axes does provide brief and relatively clear (much clearer than Hanson's) discussions of alternative views.

Considering the book as a whole this reservation is of minor importance. We are often told that the best way to introduce people to a subject is to present them with discussions of the problems characteristic of the discipline by people who have been actively concerned with these problems. Professors Danto and Morgenbesser have provided us with at least one confirming instance for this hypothesis.

Edward H. Madden, the editor of *The Structure of Scientific Thought,* has stumbled into at least two pitfalls that Professors Danto and Morgenbesser have conspicuously avoided. He has failed to devise an approach to his subject matter in terms of which his choice and organization of articles could provide a clear statement of the objectives and scope of the philosophy of science, and (perhaps as a consequence) he has endeavored to cover a wider range of topics in a volume containing only one third more readings.

The effects of the wide range of topics are reflected in the lengthy introductions preceding each of Professor Madden's seven chapters, which frequently must supply a sense of the importance of the problems discussed that could have been provided by the readings themselves had there been more space for the representa-

tion of alternative points of view. The outcome of Professor Madden's failure to provide an approach to his subject matter is most clearly visible in his first and last chapters and in the absence of separate chapters on explanation and concept construction.

The first chapter ("Making Sense of Science") contains five articles all of which make some interesting observations about science. However, there is no clear reason why these five articles should be placed in a chapter with such a heading and articles that are found elsewhere should not. Professor Madden's failure to keep his categories clean is egregiously exhibited in the seventh and final chapter ("Science and Values"). Most of the articles in this chapter would have been more appropriately placed in a volume of readings in ethics. (Other articles in his anthology indicate that Professor Madden is not committed to avoiding moral, sociological, psychological, and historical questions, as Professors Danto and Morgenbesser are.) However, the last article in the chapter ("Value Judgements in Scientific Validation" by Richard Rudner) is concerned not with ethics but with the logical role of values in confirmation and would have been suitably placed in a chapter on confirmation.

Professor Madden devotes two chapters (five and six) to confirmation and one chapter (four) to discussions of causal connection. He thereby supplies materials not found in the Danto and Morgenbesser volume. Unfortunately, he provides no coherent treatment of controversies arising in connection with explanation and concept construction. Instead, excerpts from *Studies in the Logic of Explanation* by Hempel and Oppenheim find an unexplained position in the first chapter, and other discussions of these matters are scattered through the second and third chapters which are officially devoted to philosophical problems arising from developments in the physical, biological, and social sciences. Had the editor of *The Structure of Scientific Thought* replaced the first and seventh chapters with a coherently organized series of selections dealing with concept construction and explanation, the *raison d'être* of his chapters on the separate sciences would have been clearer.

The articles included in Professor Madden's volume are in general of high quality. His selected bibliography is much more extensive than that found in *Philosophy of Science*. Unfortunately the lack of a clear conception of his discipline which detracts from his anthology reduces the value of his bibliography as well.

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Measurements of Mind and Matter. G. W. Scott Blair. New York: Philosophical Library, 1956. 115 p. $4.50.

The author is mainly concerned to discuss problems of measurement in psychology and physics, with considerable emphasis on psychophysics. Of the nine short chapters, four are devoted to the theory of dimensions; yet there is no satisfactory formal discussion of how dimensions are to be defined. This lacuna is characteristic of the book. Its philosophical godparents are the writings of Bridgman, Campbell, and Dingle.

More than thirty years ago Bridgman and Campbell had interesting and important things to say. Serious discussions of measurement today must take account of the large mathematical literature on scaling in psychology as well as of the increasing body of literature on the foundations of measurement in the philosophy and methodology of science. The present book does not at any point satisfy modern standards of exactness and clarity. On behalf of the author it should be mentioned that the manuscript was finished early in 1948, but not published until 1956.

It may also be said in behalf of the author that he deliberately intended to write a relatively nontechnical book. Unfortunately, in the reviewer's opinion, the result has been a book about which it is hard to be serious. It is mainly a pastiche of comments and random quotations from everyone from Bergson to Wertheimer. Moreover, the author's partial endorsement of the bizarre philosophy of time of J. W. Dunne must itself be judged as at best eccentric.

Patrick Suppes

Stanford University

NEW BOOKS

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NOTES AND NEWS

Dr. Henry S. Leonard, formerly head of the department of philosophy at Michigan State University, has recently been appointed University Professor. For the past two years, Dr. Leonard has been at the Institute for Advanced Study at Princeton; his work has been in the field of non-standard or modal logic. He will become the third University Professor, a title which implies independence of normal departmental boundaries.

Professor Leonard will be succeeded in his post as head of the philosophy department by Professor William Callaghan. Dr. Callaghan has been since 1959 acting head of the philosophy department, which he joined in 1949. He holds two degrees from Harvard University and the Ph.D. degree from Columbia University. In 1957 he traveled to Italy for research in contemporary Italian philosophy, especially of the logical-empiricist school.

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